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Side Wire Feed for Welding Apparatus

The problem:

Complex electronic assemblies with integrated-circuit modules as components often have large numbers of closely-spaced miniature terminals which must be interconnected. Wire-wrap techniques cannot be used because of space limitations. Sequential welding is often used, but this technique often requires the removal of selected portions of insulation prior to welding.

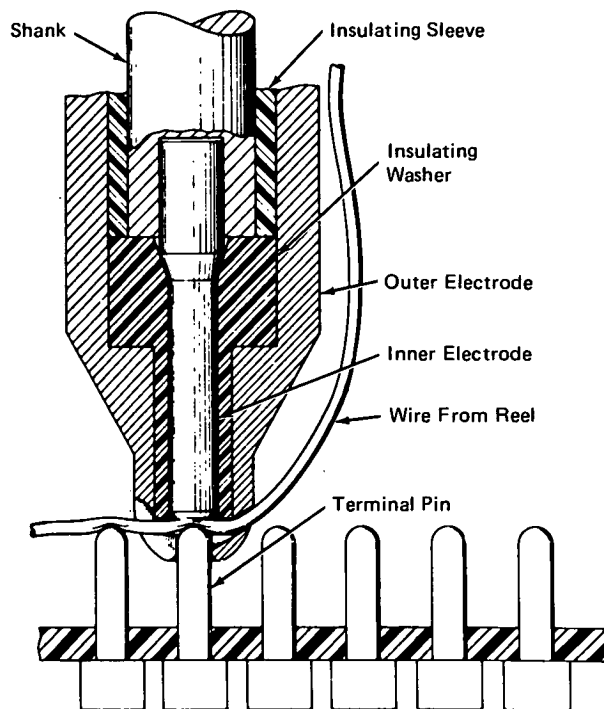
The solution:

A coaxial electrode arrangement has been devised which has a solid central electrode, an insulated outer electrode, and a transverse channel for feeding wire through the tip of the electrode assembly. As necessary, polymeric insulation is thrust aside by pressure, which is provided by a separately operated mechanism acting through the central electrode.

How it's done:

A length of wire from a supply reel is threaded through the outer electrode, passing through a transverse opening and a slot to a previously made connection (see figure). The electrode is provided with an axial opening which encircles the shank of the terminal or pin to which the wire is to be welded and pushes away any insulation around the pin.

The inner electrode is coaxial with the outer electrode but separated by an insulating sleeve and washer. The electrode, made of a metal which can withstand the erosive effects of welding, is press fitted into the shank, which may be fabricated from a brass rod. Both electrodes are attached to a mechanism which lowers the welding assembly over a pin either by a manual operation or by a programed mechanical operation. This mechanism also provides the necessary welding pressure. With polymer-insulated wire, the displacement of the insulation is effected by the initial application of pressure greater than that required for welding, followed by application of a lower welding pressure. Retraction of the mechanism followed by relocation to the next pin results in routing of the wiring. The opposing hole and slot in the electrode assures proper alignment of the wire to subsequent pins.



Side Wire-Feed Welding Apparatus

(continued overleaf)

Note:

Requests for further information may be directed to:
Technology Utilization Officer
NASA Pasadena Office
4800 Oak Grove Drive
Pasadena, California 91103
Reference: TSP74-10214

Patent status:

Title to this invention, covered by U.S. Patent No. 3,822,373, has been waived under the provisions of the National Aeronautics and Space Act [42 U.S.C. 2457(f)], to: California Institute Research Foundation, Pasadena, California 91109.

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